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EDITED BY

REV. J. L. ZABRISKIE,

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CONTENTS.

		PAGE
I.	Note on a Variety of *Salpingœca gracilis* (Plate 36)	101
II.	Notes on the Structure of the Fruit-stone of the Date (Plate 37)	107
III.	Proceedings	112
IV.	Publications Received	117
V.	Index	119

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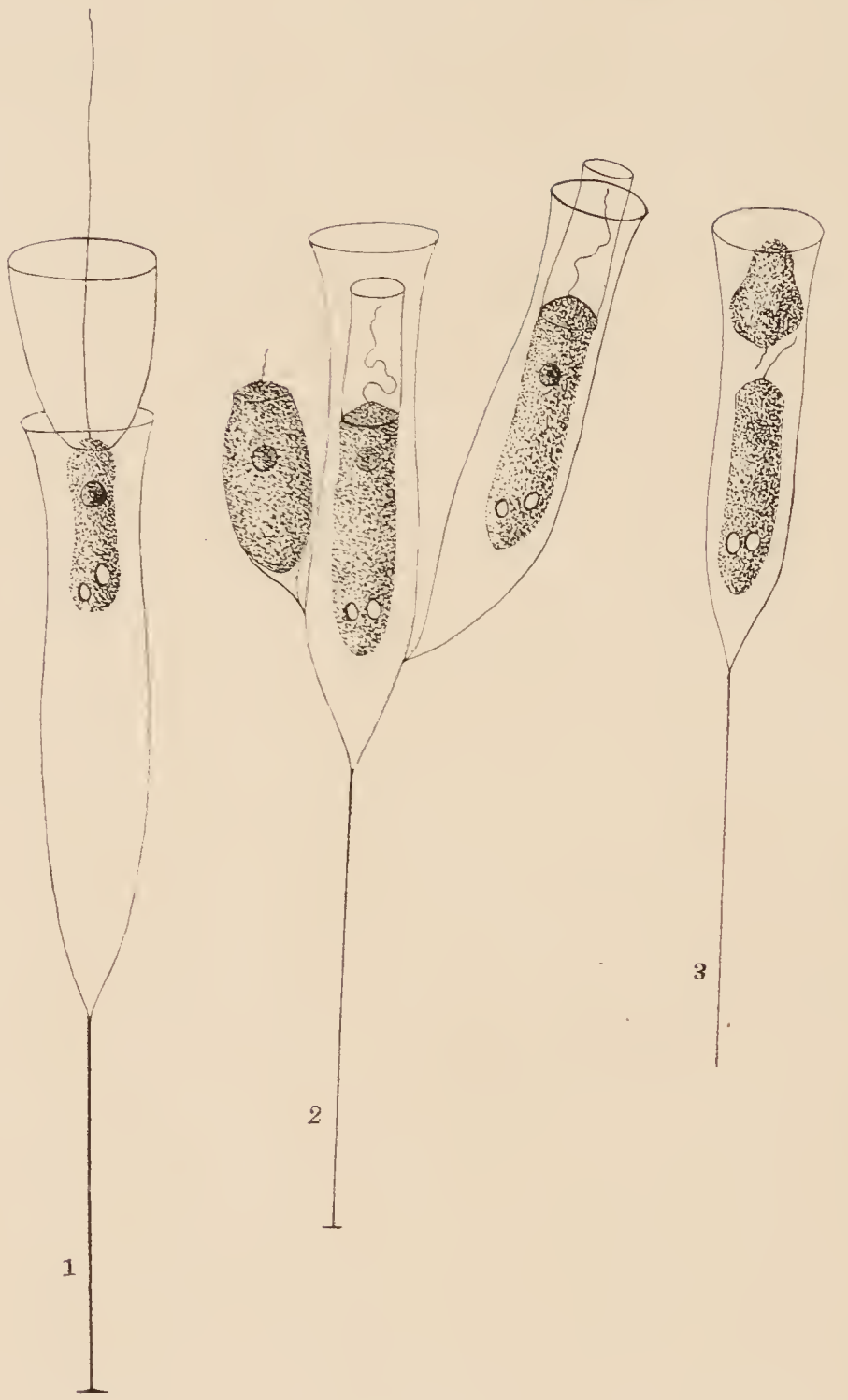
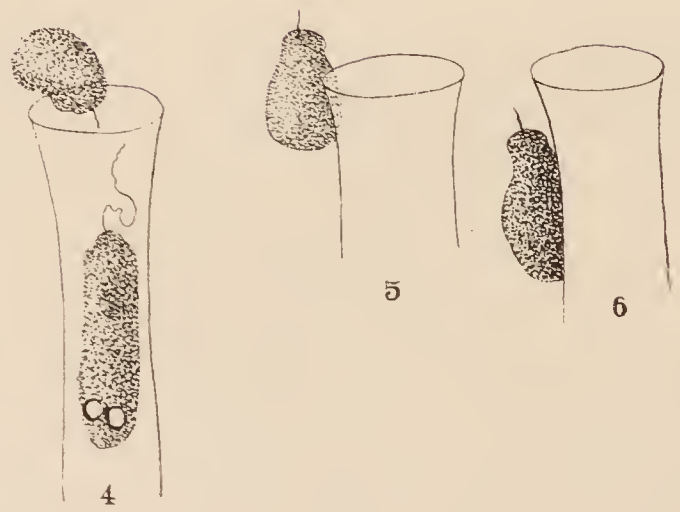




SALPINGŒCA GRACILIS.

JOURNAL

OF THE

NEW-YORK MICROSCOPICAL SOCIETY.

VOL. VIII. OCTOBER, 1892. No. 4.

A NOTE ON A VARIETY OF SALPINGŒCA GRACILIS J.-CLK.

BY ALFRED C. STOKES, M.D.,

Corresponding Member of the New-York Microscopical Society.

(*Presented June 17th*, 1892.)

In October of last year (1891) I received, through the kindness of Mr. Stephen Helm, a gathering made from the Morris and Essex Canal near Claremont, N. J. The collection was an exceedingly rich one, containing several microscopic animals which up to that time had not been seen by any human eye. These are in the care of my courteous correspondent, and have been by him referred to in a recent number of this JOURNAL. It is consequently not to these remarkable and remarkably interesting creatures that I wish now to refer, but to a minute member of the group of charming Infusoria classed together by systematists in the order Choano-Flagellata, or "the collared monads." These beautiful little creatures have long been particularly interesting to me, not only on account of their attractive and artistic forms, their unusual habits and characteristic structure, but because they are especially American Infusoria, although many have been found in Europe. They were originally discovered here

Explanation of Plate 36.

FIG. 1—*Salpingœca gracilis* J.-Clk. Typical form.

FIG. 2—A small colony of the brackish-water variety, with two loricæ, and with an embryo recently escaped from the parent sheath and secreting its lorica.

FIG. 3—Embryo soon after separation from the parent.

FIGS. 4, 5, and 6—Embryos leaving the parent lorica to assume a position externally adherent.

by the late Professor H. James-Clark, who connected them in an intimate manner with the microscopic structure of the sponges. They have been studied by Stein, by Saville Kent, and by Butschli in Europe, but in this country, the land in which they were first found and in whose fresh and salt waters they are in profusion, microscopists have almost entirely neglected them; yet they are worthy of every attention. The explanation of this apparent neglect seems to lie in the small size of the infusorians, and in the consequent demand for high-power objectives in their study.

The twigs and other objects in the water from the Morris and Essex Canal sent me by my correspondent, were adorned with a great number, indeed with hundreds, of a species of *Salpingœca* so nearly resembling James-Clark's *Salpingœca gracilis* that I had no hesitation in identifying it as that form. But almost at once there entered two facts which gave me pause. First, the animalcule had a habit which has not thus far been recorded with *Salpingœca gracilis* nor with any other member of the class; or perhaps I should express it as a modification of a habit common to all, but a modification until now not recorded and presumably not observed. And second, the water, when allowed to evaporate in a watch glass, deposited crystals of common salt; it was brackish water, but without this accidental occurrence I should have called it sweet, although I was surprised to find many apparently salt-water Infusoria in it, and was at a loss to explain their presence. This adds another element of interest to the *Salpingœca* which, although undoubtedly *Salpingœca gracilis*, has been modified in habit, presumably by the condition of the water, without a corresponding change in the form of body or of lorica. It has assumed another and more complex condition, and seems to be in a transition stage between a salt-water variety of *Salpingœca gracilis* and a distinct species. The addition of a pedicle to each lorica, each of which except the founder of the colony is now sessile, would force it into a new species.

The common and abundant form of the *Salpingœca gracilis* is that shown in Plate 36, Fig. 1. It is a solitary animal, rarely being found in near proximity with its fellows of the same species. It may often be seen scattered singly along a thread of alga or of some similar object in fresh water, but it is usually averse to

company. In the brackish water sent me by Mr. Helm I have found this form standing beside the variety just referred to and shown in Fig. 2, where, from the retiring, solitary creature, it is becoming a social colony like so many others of its congeners.

Of course it is not possible to imagine the cause that induced the embryo of the original aspirant after colonial honors to cling to the lorica of the parent and there produce a lorica of its own; and what induced other embryos to follow suit is as obscure; but each lorica with its enclosed animalcule represents a mature and full-grown embryo which, for some reason unknown, had not wandered, as is the usual custom, to found a home at a distance. It will be noticed that the appearance of the imperfectly formed colony is sufficiently different from the original, fresh-water individual to set the investigator to thinking; and while it would scarcely in this condition be figured and described as a new species, yet it is not unreasonable to suppose that it is on its way to that end, and that at some time in the near future it will merit a place in at least a provisional, working list of species. In these transition forms the primary, original foot-stalk answers for a support to the entire community, as it will probably continue to do, but the individuals of the group will in time, and perhaps in not a remote time, learn that they can obtain a better and a more constant food supply by elongating a foot-stalk from the posterior extremity of each constituent member. The colony, now irregular and incomplete, will then be symmetrical and regular in contour, as all similar colonies prefer to be, and each member will have the same opportunity to get food as every other one. Each individual of all such colonies is really independent of all others in the community, and its food supply depends upon its individual efforts. To have one or more deprived of its necessary aliment would be to weaken it, and to weaken its offspring so that the embryos would degenerate rather than develop upward; it would undergo degeneration rather than evolutionary advance.

The embryo that discovered there were advantages to be obtained by clinging to the parent's lorica, and thus sparing itself the trouble and the exhaustion of secreting a foot-stalk of its own, seems to have transmitted, in even a very short time, the new habit to its embryo, and these imperfect colonies are there-

fore in process of formation. A habit which seems to have been so easily acquired, and especially a habit which must be so beneficial to the animal, is not going to be forgotten nor abandoned. Thus far there has been no tendency, in the hundred or more colonies which I have seen, to produce other than an irregular form in which the loricæ are attached to one another by what seems to be a haphazard arrangement, producing an unsymmetrical and ungraceful result. Yet in some of these larger colonies there is also visible what it needed but little acumen, in one familiar with the appearance and the habit of this infusorial class, to predict, adding still another feature of great interest to these special, intermediate forms. In some of these collections of irregularly adherent loricæ or one two of the constituent animals has actually secreted a minute, secondary pedicle by means of which it is attached to the supporting lorica, be that the parent sheath or that of a member of the cluster (see the lateral zooid in Fig. 2). Here is a variety within a variety, and, if the apparent desire to change continues, the secondary pedicle will become a permanent feature, and the point of adherence will also be changed from a point on another lorica to the top of the primary pedicle, and another species will have been formed, or at least a closely connecting, varietal link between the fresh-water *Salpingœca gracilis* and a salt-water representative which has not yet been found, probably because, with the exception of James-Clark, no microscopist in this country has paid the least attention to the Choana-Flagellata of salt water. The field is entirely unoccupied, and is at the disposal of any microscopist that is properly equipped with objectives and so situated that he has access to the ocean.

But this is not all. If it was it would be interesting and suggestive, at least to the writer; but there is more which is still more surprising to the student of these special Infusoria. The animal has actually made alterations in the mode of its reproduction, thus adapting its manner of increase to its new and improved manner of living. With all other members of this group of animals, the reproduction is by the transverse fission of the parent's body; the latter divides into two parts, the one remaining in the old lorica, the other swimming off to find a new location and there producing a new lorica. The free-swimming portion

dashes out of the parent sheath with great rapidity. It leaps out with indescribable activity and is gone like a flash. In appearance it is a simple *Monad*, having an ovate body and a long, anterior flagellum, the flagellum always being at the front. To all appearance it is a *Monad*, and, if its origin were not known, the observer would be excusable for so classifying it. The monadiform germ of the fresh-water *Salpingœca gracilis* is exceedingly active for a short time, when it settles down in some pleasant spot and develops a foot-stalk and a lorica like its parent's. But this brackish-water variety has here made a change. It reproduces itself by transverse fission, it is true, but its flagellum, instead of being at the frontal extremity, is at the opposite pole; and instead of being several times longer than the body bearing it, is shorter than half that body width. This is shown in Fig. 3, where the parent is retracted into the back part of the lorica, and the young, monadiform germ is in the front and apparently upside down. It remains in this position for a few moments, and then, with great deliberateness and slowness, glides up the inner wall of the lorica and gently over the edge (as shown in Figs. 4 and 5), when its stiff, motionless little flagellum gets in the proper position, because its owner then places itself right side up. Clinging closely to the parent's lorica, it slowly glides along the outer surface, as in Fig. 6, until it reaches an acceptable resting point, when it proceeds to secrete its lorica, as shown on the left-hand side of Fig. 2. Here, instead of the wild if uncertain and wavering dash for liberty as performed by the embryos of the ordinary forms of the fresh-water members of the group, the movements are exceedingly deliberate and slow, the change being a surprising one to the microscopist that has become familiar with the hurrying and skurrying of the ordinary embryo.

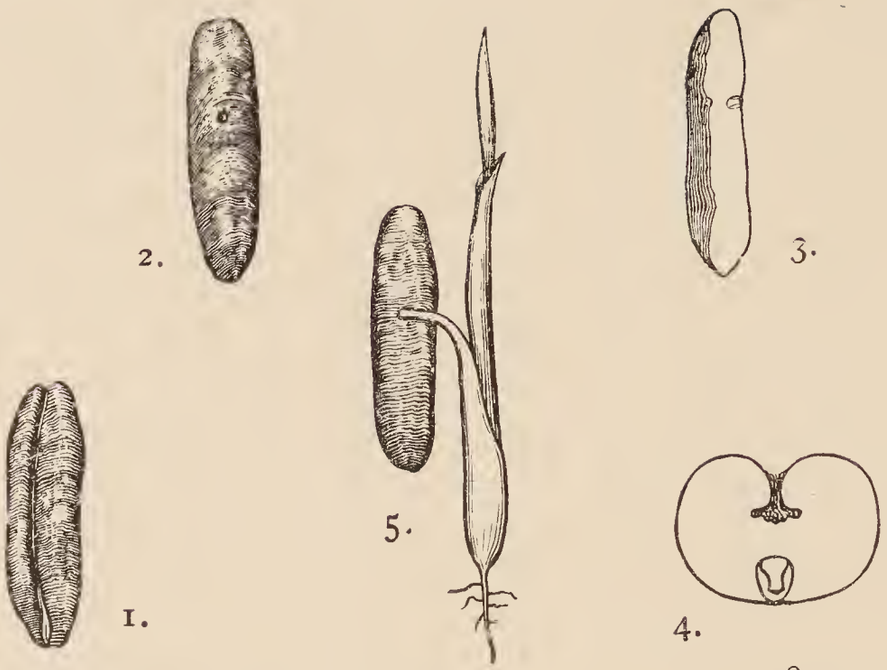
How these movements are effected I have not been able to learn. They are slow and continuous, but there is no apparent movement of the protoplasm, and no visible amœboid projections of the endoplasm. The movement also takes place as well when the animals are upside down as when they are in the right position, performed as well against gravity as in its direction. It is probable that the wave-like movements of the lower surface of the embryo needed to produce the onward progression are so

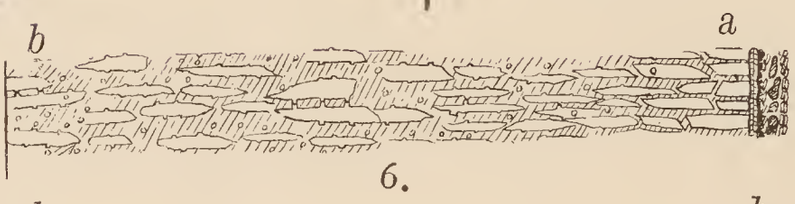
minute that they are concealed by the mass of protoplasm above, although this is almost entirely transparent.

These facts seem interesting and provocative of thought. That a little creature like this, whose protoplasmic body is only $\frac{1}{1125}$ inch in length, should deliberately change its habit of living alone and at a distance from its kindred, is interesting; but that it should permanently modify the actions of its embryo so as to bring about those altered conditions, is startling.

A recent writer lays it down as a broad and undisputed proposition that changes in form resulting in new species are not the result of slow modifications extending through countless ages, and which those that speculate on the changes induced by the visits of insects so warmly contend for. Changes, the author asserts, are by leaps and not by slow modification. There seems a greater energy at work at times than at others in producing change. It thus seems pleasant to imagine that, in finding this infusorian undergoing its changes into at least a distinct variety, one of these leaps might be actually in the process of taking place.

The irregular colonies which I have referred to are to be seen in many sizes, from a young cluster of two (the parent and the newly matured infusorian) to older clusters of a dozen or more members, some clinging to the body of the original or parent sheath, others adherent to the more recently formed lorica.





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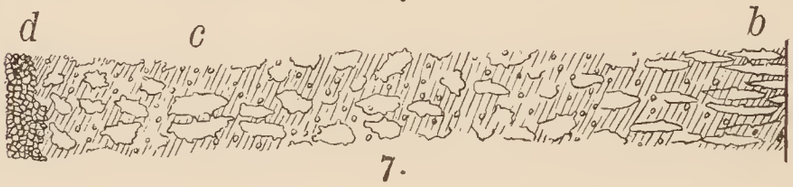

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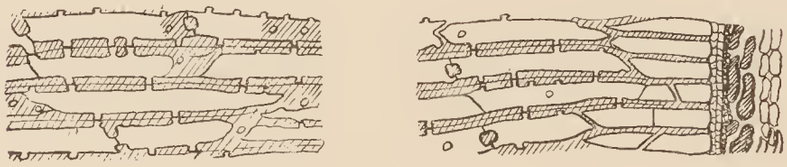

9. 8.

11. 10.

14. 13. 12.

PHŒNIX DACTYLIFERA L.

NOTES ON THE STRUCTURE OF THE FRUIT-STONE OF THE DATE, PHŒNIX DACTYLIFERA L.

BY J. L. ZABRISKIE.

(*Read June 3d*, 1892.)

The sculpturing of cell walls, resulting from thickening deposits, always presents an interesting field of microscopic investigation in vegetable structure. The variety of form exhibited, the beauty of tracery and regularity of deposit, as seen in many spiral and annulated vessels, the surprising adaptations to the necessities of the organization, continually encourage examination. A striking example of this thickening of cell walls is afforded by the endosperm of the fruit-stone of the Date.

The stone is fusiform with irregularly rounded ends (Plate 37, Fig. 1). A thin, firm, uniformly light-brown outer coating covers all the surface, excepting that occupied by the deep longitudinal cleft, extending the entire length of one side of the stone, and filled with a dark-brown, soft, cellular structure. When the stem end of the fruit-stone is uppermost, at the lower end of the cleft will be found a little, hard, grooved, conical prominence, projecting downward and indicating the distal end of the fruit, opposite the stem. On the side directly opposite the cleft, and usually a little above the middle of the stone, may be noticed a small circular depression enclosing a hemispherical prominence and indicating the position of the embryo within (Fig 2). A longitudinal section of the entire stone through the cleft (Fig. 3) shows the position of the embryo, which is seated, entirely free excepting a slight detachment at its inner end, in a little ovoid cavity. A transverse section through the entire stone and through the embryo (Fig. 4) shows the inner lateral enlargements

Explanation of Plate 37.

FIG. 1—Fruit-stone of the date, showing longitudinal cleft and conical prominence. FIG. 2—The same, showing the position of the embryo. FIG. 3—Longitudinal section, showing the embryo in its cavity. FIG. 4—Transverse section, showing the same. ×3. FIG. 5—The fruit-stone germinating. (Figs. 1, 2, 3, and 5 all natural size.) FIGS. 6 and 7—A continuous narrow band of the transverse section of the stone, from the seed coats *a* through *b* and *c* to the soft structure of the cleft at *d*. × 50. FIG. 8—A portion of the transverse section at *a*. × 100. FIG. 9—A portion of the same at *b*. × 100. FIG. 10—Two cells of the same at *c*. × 200. FIG. 11—A portion of the same at *d*. × 200. FIG. 12—Longitudinal-tangential section, showing outer seed coats on the left hand and beginnings of the spindle cells on the right hand. × 75. FIG. 13—Three cells from the same section with abundant capillary canals. × 200. FIG. 14—A portion of the middle of the same section. × 200.

of the cleft, filled with the brown cellular tissue. In germination the embryo issues from the little depression (Fig. 5), the root descends into the soil, the plumule rises with its successive leaves, but the extremity of the single seed leaf remains within the stone.

The entire mass of the stone, excepting the firm brown coating, the embryonal cavity, and the cellular structure of the cleft, is a remarkably uniform, bluish-white endosperm, without flaw or blemish, nearly as hard as bone. The cells of this endosperm are of various sizes and forms, but many of them are long spindles, and the "grain" of the entire inner structure, caused by the adjoining rows of cells, considering their longer diameters, always lies in the direction of radii, converging from the hard outer coat toward a longitudinal axis, lying within the cellular structure of the cleft. Therefore the sections must lie in the planes of these radii, or in planes perpendicular to the radii, to avoid the confusion resulting from cutting the cells obliquely.

All the sections exhibited are taken at the middle of the stone, slightly below the position of the embryo. The transverse section extends entirely across the solid substance of the endosperm from the hard outer coating to the soft tissue of the cleft. The longitudinal-radial section extends in the plane of one of the radii, running from the hard coat to the long axis. And the longitudinal-tangential section lies in a plane perpendicular to such radii. These last sections were obtained by shaving off the hard coat longitudinally for only a slight depth. Deeper cutting, of course, gradually approaches the position of a longitudinal-radial section.

In preparing the sections the stone was split open by the blow of a hammer on a knife blade, applied longitudinally and transversely, and the pieces were macerated for a few days in cold water, with one drop of carbolic acid solution to the ounce to prevent putrefaction, or in a moderately strong solution of caustic soda. Either process will soften the stone sufficiently for cutting, but the soda more rapidly disintegrates the layers of the outer brown coating, thus preventing the view of these cells in their natural position. The sections were cut free-hand with a razor. The necessarily varying thickness of such a section is very instructive. In the thicker portions of the section the relations of the cells to each other will be seen, where they lie in several layers; while the internal structure of the several cells will be

more clearly discerned where, at the edges, the section thins away almost infinitesimally. The sections were cleared of cell-contents by boiling in a dilute solution of caustic soda, stained with hæmatoxylin, and mounted in balsam.

Figs. 6 and 7 represent a continuous narrow strip of the transverse section, running from *a*, through *b* and *c*, to *d*—from the brown seed coats to the soft tissue of the cleft. The cells of the seed coats will be mentioned more conveniently under a consideration of the longitudinal-tangential section. Just within the seed coats at *a* is a structure of peculiar cells, bounding the entire circumference of the endosperm, which, from their form, may be termed palisade cells. They are uniformly thickened cells with smooth walls. They vary in length. Some of them are nearly cubical. But the majority of them are hexagonal prisms, with a nearly flat outer end, next the seed coats, and an obliquely truncated end, within, toward the endosperm.

Immediately succeeding these last lie the "spindle cells," slightly overlapping each other, and with their long diameters all directed toward the long axis of the stone. In the figures the clear spaces represent the interior of the cells, and the oblique shading represents the cut surface of the adjoining thickened cell walls. In a general view of the section, next after the striking appearance of the cell cavities, the attention is arrested by the appearance of an immense number of little circles irregularly scattered through the structure. These circles are the sections of the deep and remarkably uniform pores, extending from the interior of the cells, through the thickened cell walls, to the middle lamella between two adjoining cells. This explanation is easily demonstrated by a view of the uncleared cell contents in some of the thicker portions of the section. The cell contents take the stain more deeply than the cell walls, and occasionally, where a cell has not been cut open by the section, the soda treatment has failed to expel the contents, and these contents then form a distinct dark-colored cast of the cell cavity. This cast is somewhat cigar-shaped and studded with numerous prominent projections, like stout projecting nail heads. These nail heads are evidently the casts of the cell contents filling the pores. And the little circles abounding through the structure are the sections of these pores in various positions, now emptied of their contents.

The spindle cells extend within from the palisade cells at *a* (Figs. 6, 7), through more than one-half of the entire radius of the stone, for a short distance beyond the line *b*. Succeeding this another form of cells will be met. They are very irregular in outline, have the cell walls more thickened than any of the others, and are supplied with an immense number of pores extending in every direction. Although very variable, the majority of them are sub-globular, and hence they may be termed the globular cells. They are most prominent about the position *c* of Fig. 7. At last, at *d*, the structure filling the cleft is reached—a mass of brown, thick-walled, but soft polygonal cells.

Fig 8 is an enlarged view of a small portion of the transverse section, corresponding with *a* of Fig. 6. On the right are seen the sections of cells of the seed coats. Next these are the palisade cells, with thickened, smooth, entire walls. Then come the spindle cells, at first having but few pores, but with pores increasing in number as the cells are viewed in succession, until the position *b*, Fig. 6, is reached, where they are very numerous. In a thin portion of the section, as represented in Fig 8, the middle lamella between two adjoining cell walls is plainly seen, showing that pores from adjoining cells meet at, but never pass through, the lamella, which remains as a thin membrane entirely closing each cell. Occasionally an oblique septum will be found in a spindle cell, as in two instances in Fig. 8, like a little disc on a slender shaft. This appearance is caused by the section of a thickened septum, with a pore on either side next the cell wall. Fig. 9 is an enlarged view of a few cells, also from the transverse section, taken near the position *b*. The walls are more thickened, and the pores are far more numerous. Fig. 10 gives an enlarged view of two of the globular cells at the position of *c*, Fig. 7. They are not as globular as usual, but they show the structure well. The surrounding walls are excessively thickened, and the pores are very numerous. This is the most dense portion of the entire internal structure. The appearance of the wall between the two cells, and of the outer wall of the lower cell, is of quite frequent occurrence. The middle lamella is stouter through this dense portion of the endosperm than at other positions, and takes the stain deeply. And the pores sometimes, as in this case, are so frequent and so close together, that the section of the adjoining

portions of the cell wall gives the appearance of beads strung on a stout wire. Fig. 11 shows a few of the polygonal cells of the brown substance of the cleft, taken from the last portion of the transverse section at *d*, Fig. 7.

The longitudinal-radial section so closely resembles the transverse section that it would be very difficult to distinguish them if the labels were removed from the respective slides. Therefore the description of one will answer well for the other, showing that the cells of the inner structure are successively prisms, spindles, and irregular globular cavities.

The longitudinal-tangential section presents quite a different appearance. Fig. 12 shows a small portion of such section, taken quite near the surface of the stone, but after several successive slices have been removed. The left-hand portion of the figure represents the outermost layers of the seed coats. First are found long, fusiform, hyaline cells, presenting no marked structure with high magnification. Then succeed still longer, attenuated cells, with much thickened cell walls, minute lumen, and exceedingly abundant capillary canals running from the lumen to the middle lamella, there meeting similar canals from adjoining cells. Fig. 13 gives an enlarged view of three such canal cells. These cells and the succeeding cells of the seed coats do not always lie parallel with the longitudinal axis of the stone. Usually they are longitudinal, but frequently they are disposed in groups, which branch at various angles, until sometimes they are directly transverse, parallel with the smaller circumference of the stone. Next within the canal cells follow large, irregularly elliptical, dark-brown cells, with slightly pitted walls, and usually disposed in two layers. Then follow more dense tissues, of short, fusiform, hyaline, and light-brown polygonal cells, until we come to the outer ends of the palisade cells of the endosperm, and, as the section dips a little deeper, the outer extremities of the spindles are seen as little circles, of various sizes according to the position in which they happen to be cut, and all imbedded in the dense structure of the thickened cell walls. Fig. 14 gives an enlarged view of the cut outer ends of these palisade cells and spindle cells, as they appear in this longitudinal-tangential section.

The hard structure furnished by the thickened walls of this endosperm is said to be pure cellulose. The interesting fact alone

remains to be mentioned that the extremity of the seed leaf, remaining in the germinating date-stone, enlarges, dissolves the hard cellulose, and conveys it as nourishment to the growing plantlet, until the entire stone is emptied of its contents. This action, however, although strikingly displayed in this case, is not peculiar to the date-stone alone. It is common in some form to seeds provided with an endosperm, which take up their nourishment in germination from the endosperm by special organs, which are always parts of leaves.

PROCEEDINGS.

Meeting of May 6th, 1892.

The President, Mr. J. D. Hyatt, in the chair.

Twenty-six persons present.

Dr. Carl Heitzmann was elected a Resident Member of the Society.

On motion the thanks of the Society were tendered Mr. Morris K. Jesup, President of the Board of Trustees of the American Museum of Natural History, for his kindness in granting the use of the Halls of the Museum Building on the occasion of the late Annual Exhibition of the Society; and also to Messrs. Louis P. Gratacap and William Wallace for their invaluable assistance on the same occasion.

Mr. Carlton C. Curtiss read a paper entitled "The Anatomy of the Stem of *Wistaria Sinensis*." This paper is published in full in this volume of the Journal, p. 79, and was illustrated by microscopical sections of the wood of the stem, as indicated below.

OBJECTS EXHIBITED.

1. Transverse section of one-year-old stem of *Wistaria Sinensis*, showing pith, medullary sheath, xylem, phloem, periblem, and dermatogen.

2. Transverse section of the wood, showing transition from duramen to alburnum.

3. Radial section, showing spiral tracheids of medullary sheath.

4. Tangential section, showing wood-elements, tyloses, medullary ray, etc.

5. Tracheids, isolated by Schultze's fluid.

6. Tracheæ, showing halo, canal, and thickening membrane.

7. Transverse section, showing cork, bast, etc.

8. Radial section, showing crystal and resin sacs of bast.

9. Tangential section, showing origin of cambium.

10. Transverse section, showing beginning of anomalous growth.

11. Transverse section, showing growth from cork to bast to wood to bast to wood, illustrating the theory of the paper.

Exhibits 1–11 by CARLTON C. CURTISS.

12. Transverse section of stem of *Amphilophium*, and two photomicrographs of the same: by E. G. LOVE.

MEETING OF MAY 20TH, 1892.

The President, Mr. J. D. Hyatt, in the chair.

Twenty-six persons present.

Mr. George W. Kosmak was elected a Resident Member of the Society.

Mr. William Wales, referring to the letter of Mr. H. R. Spencer, dated Buffalo, N. Y., January 27th, 1891, and published in the Proceedings of the American Society of Microscopists, said that he desired to verify the statement of that letter that Mr. Spencer, Senior, who was the father of the manufacture of microscope objectives in this country, constructed lenses of fluorspar at that time—the summer of 1860. From his personal knowledge he could verify the fact that Mr. Spencer made the said one-eighth objective for Dr. Rufus King Brown, and also a one-quarter objective, of 175° air angle, with perfect color correction, containing a fluorspar lens, for Dr. Louis Tice, which objective is now in the possession of Dr. Charles E. West, of Brooklyn.

The Corresponding Secretary presented a communication, dated May 5th, 1892, from Mr. K. M. Cunningham, of Mobile, Ala., describing seven slides prepared by Mr. Cunningham, and donated by him to the Cabinet of the Society, as follows:

"1. A slide of diatoms from Selma, Ala. The city overlooks

a high chalk bluff on Alabama River, and at numerous points on the bluff fresh water constantly trickles down its face. Wherever this is the case there is a streak of living diatoms in constant growth on the chalk. The species associated, as shown on the slide, are as follows: *Synedra fulgens*, *Cymbella cymbiformis*, *Cocconema lanceolatum*, *Navicula parva*, *N. veneta*, *Gomphonema capitatum*, *Nitzschia panduriformis*, *Suriella ovata*, a *Cocconeis*, and two species of *Melosira*.

"2. A slide of silicified coniferous wood, derived from gravel of river drift overlying chalk at Gainesville, Ala. A fine polariscope object.

"3. A slide of fossil marine diatoms, completely pyritized, and which completely dissolve in nitric acid, leaving no structural traces. These diatoms were derived from a stratum of miocene clay encountered at a depth of 700 feet in the third artesian well, recently finished at Mobile. This find of mine corroborates a fact of geological interest, as pyritized diatoms were recently found near the Atlantic seaboard, in artesian borings, at Brentford and Clayton, contiguous to the Delaware River. The diatoms, as mounted, are relucent like gold when examined by surface condensed light, and species of the following genera may be seen: *Coscinodiscus*, *Actinophticus*, *Triceratium*, *Pleurosigma*, *Navicula*, and *Synedra*, indicated by outline and surface depressions, as the specific reticulation is masked by the pyritous deposit.

"4. A slide to place upon record the character of the marine sedimentary silicious deposit from St. Stephens and vicinity, Alabama. This tripoli is one of the strata composing that portion of the tertiary formation known as the buhrstone, which traverses the States of South Carolina, Georgia, Alabama, and Mississippi. On this slide may be seen about 175 selected diatoms, polycistina, and foraminifera, showing their metamorphosed state by mineral infiltration.

"5. A slide showing numerous polycistina from the same sedimentary stratum. On the same slide the crystalline grains show bands of prismatic colors arranged axially. Under polarized light the bands of color waves travel from the periphery to the centre, or *vice versa*, as the polarizer is revolved from right

to left, or the reverse, offering a prettier phenomenon than is offered by common silicious sands.

"6. A slide showing two species of foraminifera from Bon Secour Bay, inside Mobile Bay. These shells seem to be built up with minute plates of mica, well marked under polarized light by color contrasts.

"7. A slide showing inclusions in flint. This slide was prepared as follows: Very thin flakes were detached from a flint nodule, put on the slide, and immersed in gelatin. After twenty-four hours the gelatin had dried to a thin pellicular coating, after a manner polishing the flint chips. A drop of balsam was then added and the cover glass put on. The gelatin pellicle prevented the penetration of the balsam, and assisted in retention of air in the various spicular spaces. The slide shows a variety of organic inclusions, and an ink dot marks the spot where three *Xanthidia* are grouped together, and can be easily found with a one-sixth objective. It is nearly as easy to trace out the inclusions when so mounted as it would be with a polished section of flint."

Dr. E. G. Love exhibited on the screen, with appropriate descriptions, projections of 100 lantern slides of photomicrographs of various objects.

Meeting of June 3d, 1892.

The President, Mr. J. D. Hyatt, in the chair.

Sixteen persons present.

Rev. J. L. Zabriskie read a paper entitled "Notes on the Structure of the Fruit-stone of the Date, *Phœnix dactylifera* L.," published in this volume of the Journal, p. 107, and illustrated by diagrams and microscopical preparations, as noted below.

OBJECTS EXHIBITED.

1. Sections of Cementstone from Sandai, Japan, prepared from material donated to the Society by Mr. K. M. Cunningham: by James Walker.

2. Section from fossiliferous Chert, prepared from material donated to the Society by Mr. Cunningham from St. Stephens, Ala., of concretionary structure, and a replacement of some fossil forms of Chalcedony: by James Walker.

3. Transverse section of the Fruit-stone of the Date, *Phœnix dactylifera* L.

4. Longitudinal-radial section of the same.

5. Longitudinal-tangential section of the same.

6. Transverse section of the same, showing the embryo *in situ*.

Exhibits 3–6 by J. L. ZABRISKIE.

Mr. James Walker donated to the Cabinet of the Society the two slides donated by him, as stated above.

MEETING OF JUNE 17TH, 1892.

In the absence of the President and Vice-President, Rev. J. L. Zabriskie was elected chairman.

Twelve persons present.

The Corresponding Secretary presented a paper by Dr. Alfred C. Stokes, entitled "A Note on a variety of *Salpingœca gracilis* J.-Clk." This paper was illustrated by beautiful drawings, and is published in this volume of the JOURNAL, p. 101.

OBJECTS EXHIBITED.

1. *Nitella*, showing unusually fine circulation.

2. *Melicerta ringens*.

3. A colony of *Limnias ceratophylli*.

4. Larva of *Dytiscus marginalis*, young.

Exhibits 1–4 by STEPHEN HELM.

5. Section of fossil Coral from Chautauqua, N. Y.: by JAMES WALKER.

PUBLICATIONS RECEIVED.

The American Monthly MicroscopicalJournal: Vol. XIII., Nos. 6—8 (June—August, 1892).

The Microscope: Vol. XII., Nos. 6—8 (June—August, 1892).

School of Mines Quarterly: Vol. XIII., No. 4 (July, 1892).

Bulletin of the Torrey Botanical Club: Vol. XIX., Nos. 7, 8 (July, August, 1892).

Missouri Botanical Garden: Third Annual Report (1892).

Anthony's Photographic Bulletin: Vol. XXIII., Nos. 11—16 (June 11—August 27, 1892).

The Observer: Vol. III., Nos. 1—8 (January—August, 1892).

Insect Life: Vol. IV., Nos. 9—12 (June—August, 1892).

Psyche: Vol. VI., Nos. 195, 196 (July, August, 1892).

Cornell University Experiment Station: Bulletins 38—41 (June—August, 1892).

Natural Science Association of Staten Island: Proceedings (June, 1892).

San Francisco Microscopical Society; Proceedings: Meetings of May 4—August 17, 1892).

Massachusetts Horticultural Society; Transactions: Part 1, 1892.

Bulletin of the Essex Institute: Vol. XXIV., Nos. 1—3 (January—March, 1892).

New York Academy of Sciences; Transactions: Vol. XI., Nos. 3—5, (1892).

American Academy of Arts and Sciences; Proceedings: Vol. XXVI. (1892).

American Museum of Natural History: Annual Report (1892).

Michigan Flora: From the authors, W. J. Beal and C. F. Wheeler (1892).

United States Department of Agriculture: Division of Vegetable Pathology, Bulletin 1 (1891); Report of the Microscopist (1892).

The Ottawa Naturalist: Vol. VI., Nos. 3, 4 (July, August, 1892).

Canadian Institute: Transactions, Vol. IV., Part 2 (April, 1892): Annual Archæological Report (1892): Appeal on the Rectification of Parliament (1892).

The Nova Scotia Institute of Science: Proceedings; Vol. I., Part 1 (1891).

Journal of the Royal Microscopical Society: Parts 3, 4 (June—August, 1892): Charter, By-Laws, and List of Fellows (1892).

International Journal of Microscopy and Natural Science: Vol. II., Part 15 (July, 1892).

Manchester Microscopical Society: Transactions and Annual Report (1891).

Journal of the Quekett Microscopical Club: Vol. V., No. 31 (July, 1892).

The Naturalist: Nos. 203, 205 (June—August, 1892).

Royal Society of New South Wales; Journal and Proceedings: Vol. XXV. (1891).

The Victorian Naturalist : Vol. IX., No. 1 (May, 1892).

Records of the Australian Museum : Vol. II., No. 1 (April, 1892).

Annual of the Universal Medical Sciences : Vols. I—V. (1892).

The Satellite : Vol. V., Nos. 11, 12 (July, August, 1892).

The Hahnemannian Monthly : Vol. XXVII., Nos. 7—9 (July—September, 1892).

Indiana Medical Journal : Vol. XI., Nos. 1—2 (July—August, 1892).

Brooklyn Medical Journal : Vol. VI., Nos. 7—9 (July—September, 1892).

Johns Hopkins University Circulars : Vol. XI., No. 100 (July, 1892).

Le Diatomiste : No. 9 (June, 1892).

Revue Internationale de Bibliographie Médicale : Vol. XIII., Nos. 11—13 (June 10—July 10, 1892).

American Lancet : Vol. XVI., Nos. 7, 8 (July, August, 1892).

National Druggist : Vol. XX., No. 12—Vol. XXI., Nos. 1—4 (June 15—August 15, 1892).

Mining and Scientific Review : Vol. XXVIII., No. 23—Vol. XXIX., No. 8 (June 9—August 25, 1892).

Weekly Bulletin : Vol. I., No. 47—Vol. II., No. 58 (June 11—August 27, 1892).

Bulletin de la Société Belge de Microscopie : Vol. XVIII., Nos. 6, 7 (1892).

Bulletin de la Société Royale de Botanique de Belgique : Vol. XXX., Parts 2 (1891) ; Vol. XXXI., Parts 1, 2 (1892).

Bulletin de la Société d'Études Scientifiques d'Angers : Vol XX (1892).

Mémoires de la Société Nationale des Sciences Naturelles de Cherbourg : Vol. VII., No. 3 (1891).

Académie d'Hippone : Comptes Rendus (1891).

Gesellschaft der Naturwissenschaften zu Marburg : Sitzungsberichte (1891).

Jahresbericht der Naturhistorischen Gesellschaft zu Hannover : Vols. XL., XLI. (1892).

Wissenschaftlicher Club in Wien : Monatsblätter ; Vol. XIII., Nos. 9, 10 (June, July, 1892) : Ausserordentliche Beilage ; Vol. XIII., Nos. 3, 4 (1892).

Bollettino della Società Africana d'Italia : Vol. XI., Nos. 3—6 (March—June, 1892).

Bollettino della Società Botanico Italiano : Nos. 5, 6 (1892).

La Nuovo Notarisia : Vol. III. (July, 1892).

Nuovo Giornale Botanico Italiana : Vol. XXIV., No. 3 (July, 1892).

Bulletin de la Société Impériale des Naturalistes de Moscou : Nos. 1—4, (1892).

Memorias de la Sociedad Cientifica "Antonio Alzate" : Vol. V., Nos. 7—12 (1892).

Revista del Museo de la Plata : Vol. II. (1891).

INDEX TO VOLUME VIII.

PAGE

Annual Exhibition 93
Artesian well of Mobile 63, 65

Blood, The, after electrocution 90
Bolles, E. C., Box mounts of minerals 39
Britton, N. L., *Roridula* 36
—— North American species of the genus *Scirpus* 51

Cell-theory, Fallacy of the 91
Coal, Fossiliferous 61
Committee on Annual Exhibition 35, 55
—— on nomination of Officers 37
—— on Admissions 55
—— on Publications 55
Cordylophora lacustris 43
—— *coronata* 48
Cox, Charles F., What is a Diatom ?.. 1
Cunningham, K. M., New diatomaceous material 34
—— Rhizopods 37
—— Polycistina and tripoli 53
—— Diatoms, coal, tripoli 60
—— Coal shale, tripoli, pyritous sand. 64
—— Polycistina, lignite 64
—— Diatoms, polycistina 113
Curtiss, Carlton C., Anatomy of stem of *Wistaria Sinensis* 79

Date, Structure of the fruit-stone of the 107
Diatom, What is a ? 1
Diatoms, Marine, at Poughkeepsie 34
—— from Tuscaloosa, Ala 60
—— from Selma, Ala 113
Donations to the Cabinet and Library:
K. M. Cunningham, 34, 37, 53, 60, 64, 113
Henry C. Bennett 35
G. R. Lumsden 51
James Walker 116
Drosera rotundifolia, D. longifolia, D. filiformis 36
Dudley, P. H., Structure in Steel 69

PAGE

Election of Officers 52
Electrocution, The blood after 90
Evania appendigaster 60
Exhibition, The Annual 93

Fallacy of the cell-theory 91
Fluorspar lenses 113
Fruit-stone of the Date 107
Fungus, A, in silicified wood 55

Gottlieb, J. A., *Trichina spiralis* 36

Heitzmann, Carl, Fallacy of the cell-theory 91
Helm, Stephen, *Cordylophora lacustris*, and five new forms 43
Hyatt, J. D., *Drosera* 36
Hydroxylamine as a paralyzing agent 28
Hyptia 59

Julien, A. A., Fungus in silicified wood 55

Kunz, George F., Artificial rubies 56

Lagotia cæruleus 46
Lamp, Stratton's Microscopical 54
Lenses, Fluorspar 113
Lockwood, Samuel, The blood after electrocution 90
Love, E. G., History and development of the microscope 34
—— Projections of lantern slides 115

Microscope, History and development of the 34
Minerals, Paper boxes for mounting .. 39

Octocella libertas 48
Officers, Election of 52
Polarizer, Revolving apparatus for 92
Polycistina 53, 64, 113
President's Address 69

PAGE

PROCEEDINGS:
Meeting of October 2d, 1891..... 34
16th..... 35
December 4th..... 51
18th..... 52
January 5th, 1892..... 52
15th..... 55
February 5th..... 60
19th..... 90
March 4th..... 90
18th..... 91
April 1st..... 91
15th..... 92
May 6th..... 112
20th..... 113
Publications received.....40, 66, 98, 117

Revolving apparatus for polarizer.... 92
Roridula..... 36
Rotifers, Handling..... 92
Rubies, Artificial..... 56

Salpingœca gracilis, Note on a variety of..... 101
SCHULTZE, E. A., Hydroxylamine as a paralyzing agent..... 28
Scientific Alliance..... .....34, 37
Silene antirrhina..... 36

PAGE

Spencer, H. R., Making of fluorspar lenses by..... 113
Steel, Structure in..... 69
Stem of *Wistaria Sinensis*, Anatomy of the..... 112
STOKES, ALFRED C., Note on a variety of *Salpingœca gracilis*..... 101
Stratton's Microscopical Lamp..... 54

Trichina spiralis..... 36
Tripoli 53, 63, 64

Urnatella Walkerii..... 47

WALES, WILLIAM, Fluorspar lenses of H. R. Spencer..... 113
WALKER, JAMES, Handling rotifers.... 92
—— Revolving apparatus for polarizer 92
Well, Artesian, of Mobile 63, 65
Wistaria Sinensis, Anatomy of the stem of..... 79

ZABRISKIE, J. L., Stratton's Microscopical Lamp..... 54
—— *Hyptia* and *Evania*..... 59
—— Structure of the fruit-stone of the Date..... 107

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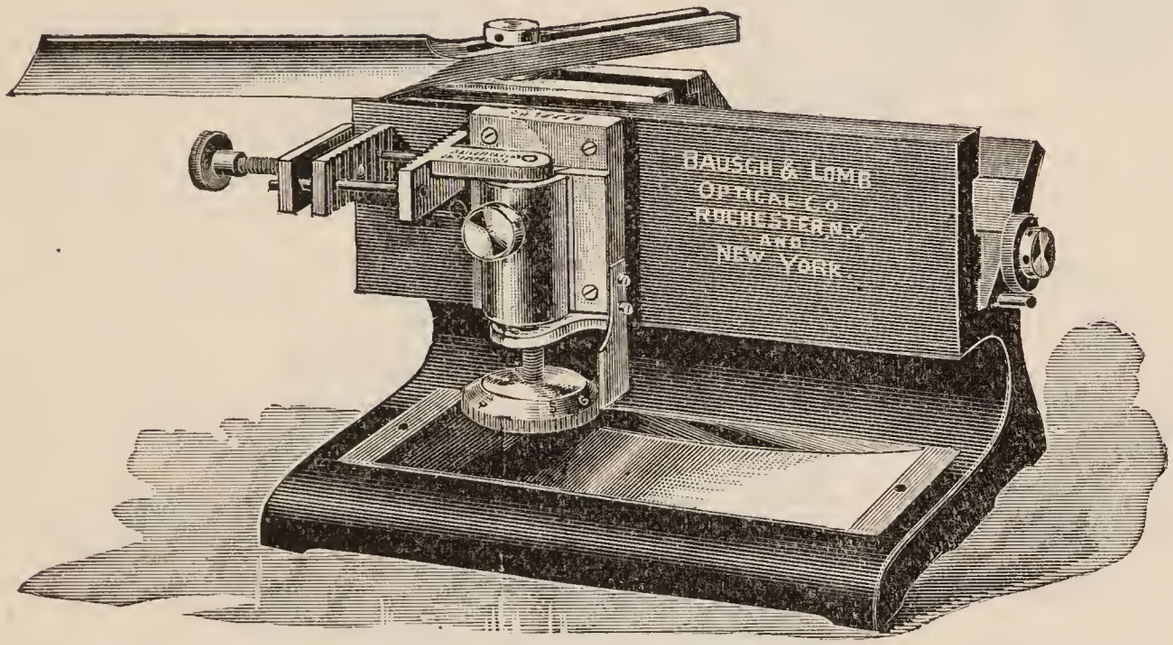

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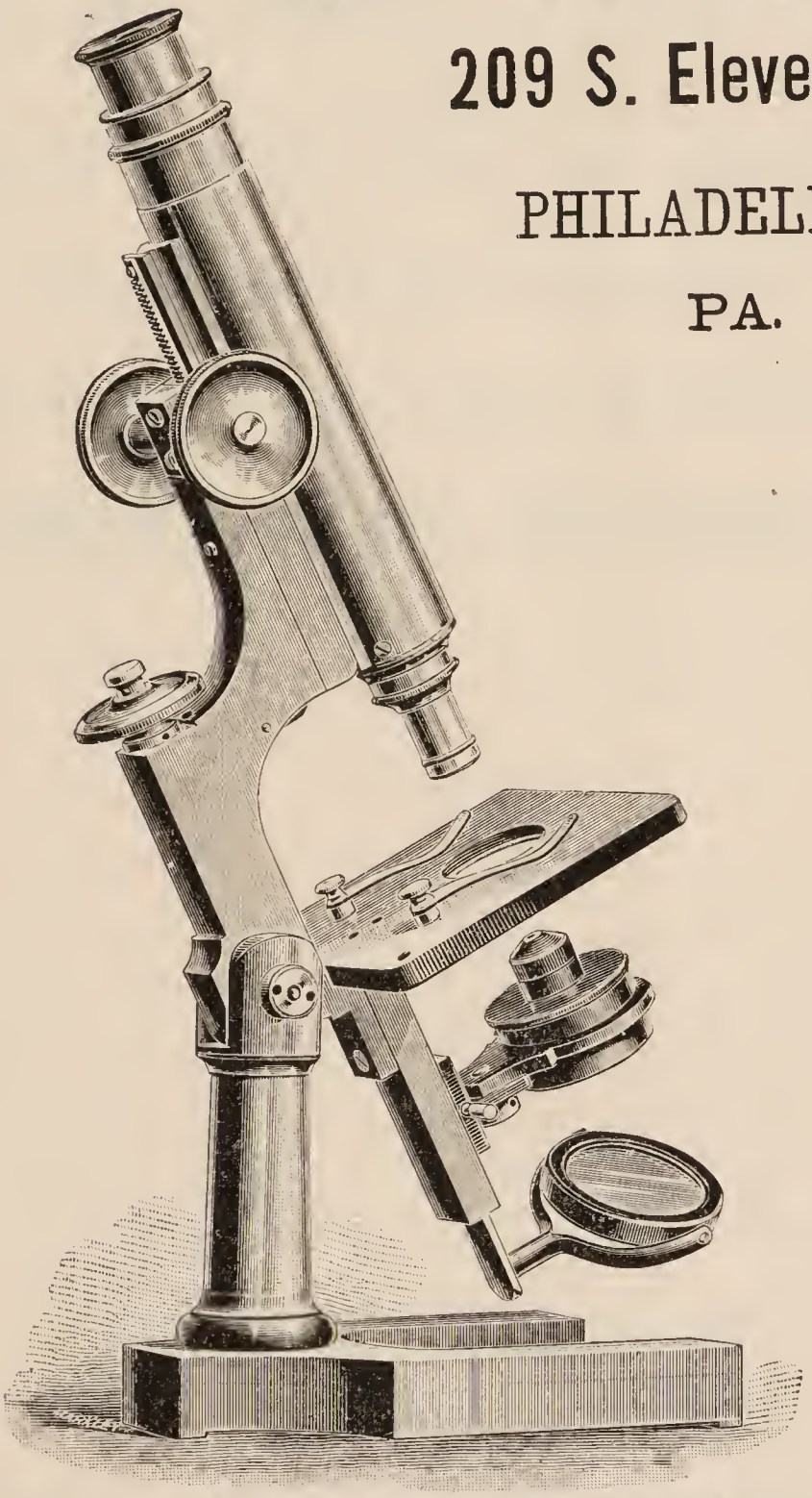

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